

# MMWR

## MORBIDITY AND MORTALITY WEEKLY REPORT

- 49 Measles — Los Angeles County, California, 1988  
 57 Yellow Fever Virus Activity — Trinidad and Tobago  
 59 Update: Influenza — United States, 1988-89 Season

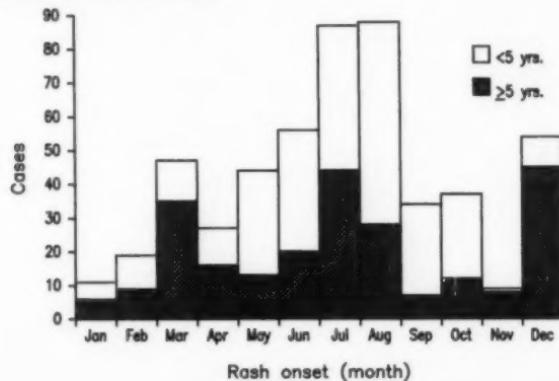
### *Current Trends*

#### **Measles — Los Angeles County, California, 1988**

A provisional total of 513 confirmed cases of measles was reported from Los Angeles County during 1988 (Figure 1). The Los Angeles County cases represent 17.5% of all (2933) cases reported for the United States during this period and an incidence rate of 6.4 cases/100,000 persons—a risk 5.3 times higher than that in the rest of the United States (1.2/100,000). In early 1988, school-aged children and adults were predominantly affected. However, in May, both the number and proportion of cases reported among children <5 years of age increased, prompting a more intense investigation. The following analysis is based on the provisional total of 355 persons with confirmed cases having onset from May 1 to December 31.

Of 353 confirmed patients with known ages and onset from May 1 to December 31, 228 (64.6%) were <5 years of age (Table 1). A total of 135 (38.2%) were <16 months of age (i.e., too young for routine vaccination), including 87 (24.6%) <12 months of age; 93 (26.3%) were 16 months to 4 years of age. Infants <12 months of age had the

**FIGURE 1. Confirmed measles cases, by month of rash onset and patient age — Los Angeles County, California, 1988**



*Measles — Continued*

highest reported age-specific incidence rate (66.9/100,000) (Table 1). Race/ethnicity was known for 331 (93.2%) patients; of these, 257 (77.6%) were Hispanic. The risk for measles for Hispanics (11.3/100,000) was 3.6 times that for black non-Hispanics (28 cases; 3.1/100,000) and 12.6 times that for white non-Hispanics (31 cases; 0.9/100,000).

Preventability status\* was known for 353 (99.4%) of the cases; 150 (42.5%) of these were preventable, and 203 (57.5%) were considered programmatically nonpreventable. However, among the 90 vaccine-eligible preschoolers aged 16 months to 4 years for whom preventability status was known, 77 (85.6%) had preventable measles. Of the 203 patients with nonpreventable illnesses, 135 (66.5%) were in children younger than the recommended age for routine vaccination, and 50 (24.6%) were in previously vaccinated persons. Of the remaining 18 (8.9%) patients with nonpreventable measles, five had a philosophic exemption or a medical contraindication to receiving the vaccine, and 13 were born before 1957.

The setting of transmission was known for 209 (58.9%) patients, of whom 120 (57.4%) had known household exposures to measles. Sixty-three (30.1%) acquired measles in medical settings, where transmission occurred both among and between patients and personnel. Transmission also occurred in day-care centers, schools, and colleges.

One hundred twenty-two (34.4%) patients were hospitalized. The reported age-specific hospitalization-to-case rate was similar for infants (43.7%) and preschool-aged children (1–4 years of age) (38.3%), slightly lower for adults ≥20 years of age (32.7%), and lowest for persons 5–19 years of age (17.1%). Of the 355 patients, 60 (16.9%) had diarrhea, 37 (10.4%) had otitis media, 35 (9.9%) had pneumonia, three (0.8%) had encephalitis, and two (0.6%) had meningitis. One adult patient with hemophilia and human immunodeficiency virus-related illness was probably exposed to measles at the medical center where he was employed. His course was complicated by pneumonia, respiratory failure, and encephalitis, but he recovered after treatment with intravenous immune globulin and ribavirin.

\*According to the CDC classification, a case is considered preventable if measles illness occurs in a U.S. citizen 1) at least 16 months of age, 2) born after 1956, 3) lacking adequate evidence of immunity to measles (documented receipt of live measles vaccine on or after the first birthday, or physician-diagnosed measles disease), 4) without a medical contraindication to receiving vaccine, and 5) with no religious or philosophic exemption under state law (1).

**TABLE 1. Age distribution and incidence rates of reported measles cases — Los Angeles County, California, May 1, 1988—December 31, 1988\***

Age group (yrs)	No.	(%)	Rate†
<1	87	( 24.6)	66.9
1–4	141	( 39.9)	27.3
5–9	37	( 10.5)	6.6
10–19	33	( 9.3)	2.6
≥20	55	( 15.6)	1.0
<b>Total (age known)</b>	<b>353</b>	<b>(100.0)</b>	<b>—</b>
Age unknown	2	—	—
<b>Total</b>	<b>355</b>	<b>—</b>	<b>4.4</b>

\*Number and proportion of patients <5 years of age increased in May.

†Cases/100,000 population (1985 population estimates).

**Measles — Continued**

Two measles-associated deaths occurred for a reported death-to-case ratio of 5.6/1000 cases. One death occurred in an 8-month-old infant, the other in a 23-month-old unvaccinated child. Both patients had nosocomially acquired cases and were exposed to measles while hospitalized for other illnesses.

On July 21, the Los Angeles County Department of Health Services lowered the minimum age for measles vaccination to 12 months. Media announcements informed the public of measles transmission in Los Angeles County, and parents were urged to have their children vaccinated. The health department also recommended that 1) medical facilities, including emergency rooms (ERs), vaccinate measles-susceptible patients between 12 months and 4 years of age seen for any reason, unless a valid contraindication to vaccination exists; 2) ER staff promptly screen patients and isolate those suspected of having measles; and 3) medical staff without evidence of immunity to measles and who have patient contact be vaccinated.

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**Editorial Note:** Measles transmission in preschool-aged children remains a major impediment to elimination of measles in the United States (2). Measles epidemiology in Los Angeles County is similar to that of other recent inner-city measles outbreaks among preschoolers in low socioeconomic groups in which most affected persons were unvaccinated (2-4). To improve vaccine coverage in high-risk children <15 months of age, the Immunization Practices Advisory Committee (ACIP) recently recommended that public health officials in areas with recurrent measles transmission lower the minimum age for routine vaccination to 9 months of age (5). Children vaccinated before their first birthday should receive single-antigen measles vaccine and be revaccinated with measles, mumps, and rubella vaccine (MMR) at 15 months of age. An alternate strategy is to lower the age for routine vaccination to 12 months using one dose of MMR.

Lowering the minimum age for vaccination is an important adjunct to control measles transmission among children younger than the routine age for vaccination. However, the large percentage (77.8%) of vaccine-eligible patients 16 months to 4 years of age who were unvaccinated demonstrates the need for intensive efforts to increase vaccine coverage in this hard-to-reach group. Thus, long-term outreach programs are needed for parents and children in low socioeconomic groups in urban areas. Programs should emphasize the following:

- Barriers to obtaining immunizations (e.g., physical or sociocultural) should be minimized, for example, by providing vaccination clinics on weekends and during evening hours convenient to families needing these services;
- Local community leaders and health officials should collaborate to promote age-appropriate vaccinations and use of existing public health systems;
- Community settings, such as church groups, schools, and mobile vans in neighborhoods, should be considered for vaccine delivery and health education programs.

Such outreach efforts may improve vaccination levels, decrease measles transmission, and promote regular preventive health care.

**Measles — Continued**

In Los Angeles County and other areas with recent measles outbreaks in the United States, multiple settings of transmission have been identified (2-4). Exposure to measles in medical settings has been important in perpetuating measles transmission (2-4,6). While most of the transmission in medical settings involved preschool-aged children, medical personnel have also been affected. The ACIP recommends that hospitals and other medical facilities ensure that personnel at risk for occupational exposure to measles be immune (7). A survey conducted in 1985-86 indicated that only eight of the 147 acute-care hospitals in Los Angeles County had mandatory policies requiring employees to provide documentation of measles immunity (Immunization Unit, California Department of Health Services, unpublished data). In Los Angeles County, three medical centers reported nearly half (169) of the 355 measles cases with onset from May 1 to December 31, 1988, including one center that accounted for more than one fourth (96) of all cases. Two of these centers have instituted policies for employees at risk for exposure to measles.

The risk for measles transmission was even more likely to be high in Los Angeles County because the inner-city Hispanic community (which was the major focus of

(Continued on page 57)\*

**TABLE I. Summary — cases of specified notifiable diseases, United States**

Disease	4th Week Ending			Cumulative, 4th Week Ending		
	Jan. 28, 1989	Jan. 30, 1989	Median 1984-1988	Jan. 28, 1989	Jan. 30, 1989	Median 1984-1988
Acquired Immunodeficiency Syndrome (AIDS)	279	U*	206	2,110	1,879	857
Aseptic meningitis	73	105	94	247	302	319
Encephalitis: Primary (arthropod-borne & unspes)	5	18	18	27	57	57
Post-infectious	1	4	2	5	5	5
Gonorrhea:	12,439	12,943	17,208	45,168	53,944	64,851
Civilian	245	216	361	711	833	1,337
Military	661	434	434	1,985	1,343	1,387
Hepatitis:	366	337	433	1,189	1,156	1,539
Type A	30	36	60	138	138	227
Type B	57	49	72	145	130	271
Non A, Non B						
Unspecified						
Legionellosis	9	15	15	41	54	54
Leprosy	-	-	3	5	4	15
Malaria	11	11	12	52	37	42
Measles: Total <sup>f</sup>	11	36	27	114	82	71
Indigenous	9	36	26	106	80	67
Imported	2	-	1	8	2	8
Meningococcal infections	45	85	58	153	243	199
Mumps	116	78	60	338	255	240
Pertussis	36	28	33	144	70	107
Rubella (German measles)	5	3	3	12	13	21
Syphilis (Primary & Secondary): Civilian	757	826	870	2,283	2,515	2,042
Military	6	4	3	21	14	13
Toxic Shock syndrome	6	6	6	16	18	19
Tuberculosis	321	349	369	1,172	993	1,048
Tularemia	1	4	2	5	14	7
Typhoid Fever	2	16	6	14	22	22
Typhus fever, tick-borne (RMSF)	2	6	1	6	6	5
Rabies, animal	84	73	73	216	183	247

**TABLE II. Notifiable diseases of low frequency, United States**

	Cum. 1989		Cum. 1989
Anthrax	-	Leptospirosis (Hawaii 6)	11
Botulism: Foodborne	-	Plague	-
Infant	-	Poliomyelitis, Paralytic	-
Other	-	Pitักษ (N.C. 1, Ala. 1)	6
Brucellosis	-	Rabies, human	-
Cholera	-	Tetanus (Fla. 1, Ala. 1)	5
Congenital rubella syndrome	-	Trichinosis	-
Congenital syphilis, age <1 year	-		
Diphtheria	-		

\*Because AIDS cases are not received weekly from all reporting areas, comparison of weekly figures may be misleading.  
†There were no cases of internationally imported measles reported for this week.

**TABLE III. Cases of specified notifiable diseases, United States, weeks ending January 28, 1989 and January 30, 1988 (4th Week)**

Reporting Area	AIDS	Aseptic Meningitis		Encephalitis		Gonorrhea (Civilian)		Hepatitis (Viral), by type				Legionellosis	Leprosy
		Primary	Post-infectious	Cum.	Cum.	Cum.	Cum.	A	B	NA,NB	Unspecified		
		1989	1989	1989	1989	1988	1988	1989	1989	1989	1989	1989	1989
UNITED STATES	2,110	247	27	5	45,188	53,944	1,985	1,189	138	145	41	5	
NEW ENGLAND	132	20	-	-	1,590	1,578	54	94	14	7	4	-	
Maine	5	1	-	-	27	33	1	4	2	-	-	-	
N.H.	2	1	-	-	9	31	13	7	3	1	-	-	
Vt.	2	-	-	-	7	15	1	2	2	-	-	-	
Mass.	71	10	-	-	604	503	26	63	5	5	3	-	
R.I.	7	3	-	-	99	100	-	14	1	1	1	-	
Conn.	45	5	-	-	844	894	13	4	1	-	-	-	
MID. ATLANTIC	616	14	1	-	3,237	7,701	443	219	17	18	12	1	
Upstate N.Y.	79	9	1	-	643	756	112	53	7	1	3	-	
N.Y. City	333	5	-	-	-	3,200	8	35	2	9	-	-	
N.J.	136	-	-	-	696	893	66	51	4	5	-	-	
Pa.	66	-	-	-	1,896	2,852	257	80	4	3	9	1	
E.N. CENTRAL	214	43	12	-	8,834	8,569	94	130	9	-	11	-	
Ohio	17	15	4	-	2,224	1,801	49	58	2	-	9	-	
Ind.	53	4	1	-	610	631	3	7	-	-	-	-	
Ill.	86	-	-	-	3,089	2,585	2	2	-	-	-	-	
Mich.	49	23	7	-	2,629	2,841	36	54	7	2	1	-	
Wis.	10	1	-	-	282	711	4	9	-	-	1	-	
W.N. CENTRAL	54	6	-	-	2,240	2,010	20	17	5	-	-	-	
Minn.	-	-	-	-	198	257	3	5	-	-	-	-	
Iowa	9	4	-	-	174	188	3	3	2	-	-	-	
Mo.	36	2	-	-	1,339	1,222	9	9	1	-	-	-	
N. Dak.	1	-	-	-	5	23	-	-	-	-	-	-	
S. Dak.	2	-	-	-	24	41	-	-	2	-	-	-	
Neb.	-	-	-	-	191	78	3	-	-	-	-	-	
Kans.	7	-	-	-	309	201	2	-	-	-	-	-	
S. ATLANTIC	370	57	3	2	14,046	13,963	148	222	15	29	4	-	
Del.	11	4	-	-	201	228	5	11	-	-	-	-	
Md.	52	6	-	-	1,409	1,211	28	46	4	8	3	-	
D.C.	37	-	-	-	921	836	-	-	-	-	-	-	
Va.	26	16	1	-	1,261	1,230	6	23	1	17	1	-	
W. Va.	1	1	2	-	151	143	2	3	-	-	-	-	
N.C.	1	11	-	1	2,071	1,647	58	82	10	-	-	-	
S.C.	16	2	-	-	1,653	1,215	3	20	-	2	-	-	
Ga.	80	4	-	-	2,385	2,900	31	9	-	1	-	-	
Fla.	146	13	-	1	3,903	4,544	16	28	-	1	-	-	
E.S. CENTRAL	41	23	-	-	4,549	4,156	29	120	18	1	3	-	
Ky.	10	8	-	-	373	365	12	32	6	-	1	-	
Tenn.	-	5	-	-	1,280	1,272	8	54	4	-	1	-	
Ala.	20	9	-	-	1,594	1,520	5	33	8	1	1	-	
Miss.	11	1	-	-	1,302	998	4	1	-	-	-	-	
W.S. CENTRAL	187	6	3	-	5,180	7,430	73	20	4	6	4	-	
Ark.	6	-	-	-	535	420	5	-	-	-	-	-	
La.	19	1	1	-	765	2,363	1	1	-	-	-	-	
Okla.	-	4	2	-	554	440	40	14	1	-	4	-	
Tex.	162	1	-	-	3,306	4,207	27	5	3	6	-	-	
MOUNTAIN	49	9	1	-	662	1,129	389	72	15	17	1	-	
Mont.	-	-	-	-	15	27	4	11	-	-	-	-	
Idaho	1	-	-	-	17	25	5	6	-	-	-	-	
Wyo.	3	-	-	-	9	13	5	1	-	-	-	-	
Colo.	3	1	-	-	46	292	38	7	2	7	-	-	
N. Mex.	-	2	-	-	86	122	34	13	2	-	-	-	
Ariz.	4	4	-	-	306	390	208	16	3	8	1	-	
Utah	8	2	1	-	50	44	28	6	5	2	-	-	
Nev.	30	-	-	-	133	216	47	10	3	-	-	-	
PACIFIC	447	69	7	3	4,871	7,420	735	295	41	65	2	4	
Wash.	51	-	-	-	219	473	35	7	-	1	-	-	
Oreg.	26	-	-	-	214	244	96	17	5	-	-	-	
Calif.	358	66	5	3	4,299	6,530	513	286	35	62	2	4	
Alaska	-	-	2	-	114	101	83	4	1	2	-	-	
Hawaii	1	3	-	-	25	72	8	1	-	-	-	-	
Guam	-	-	-	-	-	13	-	-	-	-	-	-	
F.R.	103	9	-	-	-	113	3	8	-	2	-	-	
V.I.	15	-	-	-	31	28	-	-	-	-	-	-	
Amer. Samoa	-	-	-	-	-	7	-	-	-	-	-	-	
C.N.M.I.	-	-	-	-	-	3	-	-	-	-	-	-	

N: Not notifiable

U: Unavailable

C.N.M.I.: Commonwealth of the Northern Mariana Islands

**TABLE III. (Cont'd.) Cases of specified notifiable diseases, United States, weeks ending January 28, 1989 and January 30, 1988 (4th Week)**

Reporting Area	Malaria	Measles (Rubella)					Menin-		Mumps		Pertussis			Rubella		
		Indigenous		Imported*		Total										
		Cum. 1989	1989	Cum. 1988	1989	Cum. 1988	Cum. 1988	1989	Cum. 1989	1989	Cum. 1989	Cum. 1988	1989	Cum. 1989	Cum. 1988	
UNITED STATES	52	9	106	2	8	52	153	116	338	36	144	70	5	12	13	
NEW ENGLAND	3	-	-	-	-	1	15	-	2	-	9	5	-	-	-	
Maine	-	-	-	-	-	-	3	-	-	-	2	1	-	-	-	
N.H.	-	-	-	-	-	-	3	-	2	-	5	2	-	-	-	
Vt.	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Mass.	3	-	-	-	-	1	7	-	-	-	-	-	-	-	-	
R.I.	-	-	-	-	-	-	1	-	-	-	2	-	-	-	-	
Conn.	-	-	-	-	-	-	1	-	-	-	-	2	-	-	-	
MID. ATLANTIC	9	1	2	-	1	16	14	-	11	3	16	3	-	1	-	
Upstate N.Y.	5	-	-	-	-	-	5	-	-	2	2	1	-	1	-	
N.Y. City	1	-	1	-	-	-	2	-	-	-	-	-	-	-	-	
N.J.	-	-	-	-	1	-	-	-	7	1	13	-	-	-	-	
Pa.	3	1	1	-	-	16	7	-	4	-	1	2	-	-	-	
E.N. CENTRAL	5	-	44	-	1	1	14	4	25	2	3	7	-	-	5	
Ohio	3	-	44	-	1	-	8	-	8	-	1	-	-	-	-	
Ind.	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Ill.	-	-	-	-	-	-	1	-	-	-	-	3	-	-	5	
Mich.	-	-	-	-	-	-	4	4	17	2	2	3	-	-	-	
Wis.	2	-	-	-	-	-	2	-	-	-	-	1	-	-	-	
W.N. CENTRAL	-	-	10	2	2	-	4	20	102	-	2	12	-	-	-	
Minn.	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Iowa	-	-	-	-	-	-	-	-	3	-	2	3	-	-	-	
Mo.	-	-	10	-	-	-	-	20	20	-	-	-	-	-	-	
N. Dak.	-	-	-	-	-	-	-	-	-	-	-	6	-	-	-	
S. Dak.	-	-	-	-	-	-	1	-	-	-	-	2	-	-	-	
Neb.	-	-	-	-	-	-	3	-	-	-	-	2	-	-	-	
Kans.	-	-	-	29	2	-	-	-	79	-	-	1	-	-	-	
S. ATLANTIC	7	1	2	-	1	2	28	10	51	-	2	11	-	-	-	
Del.	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	
Md.	4	1	2	-	1	1	6	-	27	-	-	-	-	-	-	
D.C.	-	-	-	-	-	-	4	2	2	-	-	-	-	-	-	
Va.	2	-	-	-	-	-	4	8	16	-	1	1	-	-	-	
W. Va.	-	-	-	-	-	-	2	-	2	-	-	-	-	-	-	
N.C.	-	-	-	-	-	-	1	3	-	2	-	1	5	-	-	
S.C.	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Ga.	-	-	-	-	-	-	1	-	-	-	-	3	-	-	-	
Fla.	1	-	-	-	-	-	7	-	-	-	-	1	-	-	-	
E.S. CENTRAL	2	-	1	-	-	-	10	12	23	3	7	3	-	-	-	
Ky.	-	-	-	-	-	-	8	9	9	-	-	-	-	-	-	
Tenn.	-	-	-	-	-	-	-	3	12	2	2	2	-	-	-	
Ala.	2	-	1	-	-	-	2	-	2	1	5	-	-	-	-	
Miss.	-	-	-	-	-	-	-	N	N	-	-	1	-	-	-	
W.S. CENTRAL	-	-	-	-	2	-	8	58	82	1	1	-	-	-	-	
Ark.	-	-	-	2	-	-	1	5	12	1	1	-	-	-	-	
La.	-	-	-	-	-	-	1	7	10	-	-	-	-	-	-	
Okla.	-	-	-	-	-	-	1	36	40	-	-	-	-	-	-	
Tex.	-	-	-	-	-	-	5	10	20	-	-	-	-	-	-	
MOUNTAIN	6	-	13	-	1	27	4	3	8	20	78	11	-	-	1	
Mont.	-	-	12	-	1	-	-	-	-	-	-	-	-	-	-	
Idaho	3	-	-	-	-	-	-	-	1	5	5	7	-	-	-	
Wyo.	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	
Colo.	-	-	-	-	-	27	2	1	2	-	1	-	-	-	-	
N. Mex.	1	-	-	-	-	-	-	N	N	-	-	1	-	-	-	
Ariz.	1	-	1	-	-	-	2	2	3	15	68	1	-	-	-	
Utah	-	-	-	-	-	-	-	-	-	-	-	2	-	-	1	
Nev.	1	-	-	-	-	-	-	-	-	-	1	-	-	-	1	
PACIFIC	20	7	34	-	-	35	56	9	36	7	28	18	5	11	7	
Wash.	-	-	-	-	-	-	1	-	2	-	1	2	-	-	-	
Oreg.	-	-	-	-	-	-	4	N	N	-	-	-	-	-	-	
Calif.	20	7	34	-	-	35	49	9	32	7	27	7	5	11	-	
Alaska	-	-	-	-	-	-	2	-	-	-	-	-	-	-	-	
Hawaii	-	-	-	-	-	-	-	2	-	-	-	9	-	-	-	
Guam	-	U	-	U	-	-	-	U	-	U	-	-	U	-	-	
P.R.	-	9	10	-	-	-	1	-	-	-	-	-	U	-	-	
V.I.	-	-	-	-	-	-	-	-	2	-	-	-	U	-	-	
Amer. Samoa	-	U	-	U	-	-	-	U	-	U	-	-	U	-	-	
C.N.M.I.	-	U	-	U	-	-	-	U	-	U	-	-	U	-	-	

\*For measles only; imported cases includes both out-of-state and international importations.

N: Not notifiable U: Unavailable <sup>†</sup>International <sup>‡</sup>Out-of-state

**TABLE III. (Cont'd.) Cases of specified notifiable diseases, United States, weeks ending January 28, 1989 and January 30, 1988 (4th Week)**

Reporting Area	Syphilis (Civilian) (Primary & Secondary)		Toxi- shock Syndrome	Tuberculosis		Tula- remia	Typhoid Fever	Typhus Fever (Tick-borne) (IIMSF)	Rabies, Animal
	Cum. 1989	Cum. 1988		Cum. 1989	Cum. 1988				
UNITED STATES	2,283	2,515	16	1,172	993	5	14	6	216
NEW ENGLAND	164	57	1	31	16	-	6	-	-
Maine	-	2	1	1	-	-	-	-	-
N.H.	-	1	-	4	-	-	-	-	-
Vt.	-	-	-	1	-	-	-	-	-
Mass.	52	25	-	5	7	-	1	-	-
R.I.	31	-	-	9	1	-	4	-	-
Conn.	81	29	-	11	8	-	1	-	-
MID. ATLANTIC	366	527	3	267	264	1	4	1	50
Upstate N.Y.	23	24	-	10	43	-	-	-	-
N.Y. City	198	365	1	196	143	-	3	-	-
N.J.	113	48	-	29	40	-	-	-	-
Pa.	21	90	2	32	38	1	1	1	50
E.N. CENTRAL	67	58	2	150	148	-	1	1	6
Ohio	4	5	2	33	28	-	-	-	-
Ind.	3	9	-	6	3	-	-	-	-
Ill.	52	32	-	59	58	-	-	-	-
Mich.	8	20	-	49	52	-	-	-	2
Wis.	-	2	-	3	7	-	-	-	1
W.N. CENTRAL	29	11	1	34	27	-	-	1	3
Minn.	1	1	-	9	7	-	-	-	13
Iowa	6	1	-	6	3	-	-	-	5
Mo.	13	3	-	7	9	-	-	-	-
N. Dak.	-	1	-	2	1	-	-	-	2
S. Dak.	-	-	1	3	7	-	-	-	2
Nebr.	9	2	-	1	-	-	-	-	-
Kans.	-	3	-	6	-	-	-	-	2
S. ATLANTIC	878	842	2	188	203	-	-	1	66
Del.	5	14	-	3	-	-	-	-	-
Md.	25	40	-	11	25	-	-	1	17
D.C.	72	21	-	15	6	-	-	-	-
Va.	46	26	-	29	23	-	-	-	17
W. Va.	2	1	-	5	6	-	-	-	6
N.C.	48	51	2	16	9	-	-	-	-
S.C.	56	33	-	36	35	-	-	-	15
Ga.	206	136	-	13	14	-	-	-	11
Fla.	418	520	-	61	82	-	-	-	-
E.S. CENTRAL	178	156	-	84	111	1	-	2	12
Ky.	4	2	-	34	40	1	-	-	6
Tenn.	56	51	-	16	18	-	-	-	-
Ala.	68	60	-	33	44	-	-	-	6
Miss.	50	43	-	1	9	-	-	-	-
W.S. CENTRAL	295	308	-	53	54	1	-	-	35
Ark.	25	-	-	4	-	-	-	-	2
La.	60	36	-	7	19	-	-	-	-
Okl.	4	13	-	-	11	1	-	-	5
Tex.	206	257	-	42	24	-	-	-	28
MOUNTAIN	21	65	3	34	17	-	-	-	7
Mont.	-	-	-	-	-	-	-	-	6
Idaho	-	-	1	-	-	-	-	-	-
Wyo.	-	-	-	-	-	-	-	-	-
Colo.	2	12	-	-	5	-	-	-	-
N. Mex.	1	7	1	8	4	-	-	-	-
Ariz.	14	11	1	24	6	-	-	-	-
Utah	4	3	-	-	-	-	-	-	1
Nav.	-	32	-	2	2	-	-	-	-
PACIFIC	296	481	4	333	153	2	3	-	27
Wash.	-	14	-	12	13	-	-	-	-
Oreg.	15	11	-	9	10	-	-	-	-
Calif.	281	463	4	296	114	2	3	-	19
Alaska	-	-	-	4	3	-	-	-	8
Hawaii	-	3	-	12	13	-	-	-	-
Guam	-	-	-	-	-	-	-	-	-
P.R.	-	52	-	6	6	-	-	-	2
V.I.	1	1	-	-	-	-	-	-	-
Amer. Samoa	-	-	-	-	-	-	-	-	-
C.N.M.I.	-	-	-	-	1	-	-	-	-

U: Unavailable

**TABLE IV. Deaths in 121 U.S. cities,\* week ending January 28, 1989 (4th Week)**

Reporting Area	All Causes, By Age (Years)						P&H** Total	Reporting Area	All Causes, By Age (Years)						P&H** Total
	All Ages	>65	45-64	25-44	1-24	<1			All Ages	>65	45-64	25-44	1-24	<1	
NEW ENGLAND	712	469	138	46	15	24	79	S. ATLANTIC	1,295	793	278	127	29	66	79
Boston, Mass.	199	108	48	28	5	10	40	Atlanta, Ga.	185	109	49	17	5	5	9
Bridgeport, Conn.	26	17	5	2	1	1	4	Baltimore, Md.	166	105	34	21	1	5	8
Cambridge, Mass.	16	15	3	-	-	-	2	Charlotte, N.C.	103	64	24	10	3	2	6
Fall River, Mass.	29	22	6	-	1	-	2	Jacksonville, Fla.	98	65	26	3	4	-	6
Hartford, Conn.	84	61	15	3	2	3	5	Miami, Fla.	122	73	23	23	3	-	1
Lowell, Mass.	39	34	3	2	-	-	4	Norfolk, Va.	62	38	14	6	-	4	6
Lynn, Mass.	18	17	-	1	-	-	1	Richmond, Va.	108	64	28	9	3	4	16
New Bedford, Mass.	30	20	6	-	3	1	5	Savannah, Ga.	42	30	7	3	1	1	3
New Haven, Conn.	44	29	6	4	2	3	5	St. Petersburg, Fla.	102	76	15	5	-	6	10
Providence, R.I.	64	43	20	1	-	-	2	Tampa, Fla.	81	48	15	8	6	4	8
Somerville, Mass.	5	3	2	-	-	-	1	Washington, D.C.	197	97	41	20	3	35	6
Springfield, Mass.	64	45	10	3	1	5	11	Wilmington, Del.	29	24	3	2	-	-	-
Watertown, Conn.	27	18	8	1	-	-	2								
Worcester, Mass.	65	57	6	1	-	1	5								
MID. ATLANTIC	3,207	2,043	608	380	90	103	169	E.S. CENTRAL	692	585	193	47	32	25	58
Albany, N.Y.	46	28	9	4	3	2	2	Birmingham, Ala.	153	98	31	10	9	5	4
Allentown, Pa.	19	16	3	-	-	-	1	Chattanooga, Tenn.	68	48	14	3	1	2	5
Buffalo, N.Y.	102	65	24	9	3	1	15	Knoxville, Tenn.	75	51	20	2	1	1	7
Camden, N.J.	43	26	8	1	2	6	1	Louisville, Ky.	188	116	47	6	10	9	10
Elizabeth, N.J.	24	20	2	1	1	-	4	Memphis, Tenn.	204	141	39	16	5	3	26
Erie, Pa. <sup>†</sup>	55	39	9	2	1	4	5	Mobile, Ala.	28	14	6	4	1	3	-
Jersey City, N.J.	50	34	9	5	-	-	1	Montgomery, Ala. <sup>§</sup>	48	35	9	2	1	1	1
N.Y. City, N.Y.	1,677	1,014	315	245	49	54	52	Nashville, Tenn.	128	92	27	4	4	1	5
Newark, N.J.	61	28	14	12	1	6	3								
Peterson, N.J.	30	25	3	-	1	1	1								
Philadelphia, Pa.	587	379	136	49	21	20	22								
Pittsburgh, Pa. <sup>†</sup>	68	44	18	4	-	2	3								
Reading, Pa.	42	38	2	1	1	-	1								
Rochester, N.Y.	118	91	17	7	3	-	8								
Schenectady, N.Y.	31	25	4	2	-	-	2								
Scranton, Pa. <sup>†</sup>	29	22	5	2	-	-	7								
Syracuse, N.Y.	94	69	15	4	3	3	8								
Trenton, N.J.	47	25	16	4	1	1	4								
Utica, N.Y.	17	15	1	1	-	-	1								
Yonkers, N.Y.	57	40	9	7	-	1	7								
E.N. CENTRAL	2,506	1,663	518	175	72	78	143	MOUNTAIN	825	548	156	71	23	27	65
Akron, Ohio	62	36	15	3	4	4	4	Albuquerque, N.M.	108	74	20	9	3	2	7
Canton, Ohio	48	37	7	2	2	-	10	Colorado Springs, Colo.	57	37	10	6	1	3	7
Chicago, Ill. <sup>§</sup>	195	145	34	7	6	3	30	Denver, Colo.	130	86	24	10	2	8	7
Cincinnati, Ohio	362	125	45	10	22	22	16	Las Vegas, Nev.	115	67	29	15	2	2	10
Cleveland, Ohio	182	117	44	14	4	3	3	Ogden, Utah	23	17	3	-	1	1	4
Columbus, Ohio	122	74	34	8	2	4	4	Phoenix, Ariz.	186	113	40	21	4	6	11
Dayton, Ohio	124	85	20	7	8	4	10	Pueblo, Colo.	15	10	3	-	-	-	2
Detroit, Mich.	268	159	40	13	8	6	13	Salt Lake City, Utah	43	27	8	3	2	-	-
Evaneville, Ind.	73	51	14	4	1	3	7	Tucson, Ariz.	146	117	18	5	7	1	17
Fort Wayne, Ind.	76	55	15	4	1	1	5								
Gary, Ind.	11	8	3	-	-	-	1								
Grand Rapids, Mich. <sup>§</sup>	66	47	14	3	-	2	2								
Indianapolis, Ind.	181	115	44	9	6	7	6								
Madison, Wis.	32	18	7	4	2	1	1								
Milwaukee, Wis.	128	96	22	3	3	4	3								
Peoria, Ill.	53	33	10	2	-	8	6								
Rockford, Ill.	67	48	12	4	1	2	6								
South Bend, Ind.	38	30	3	5	-	1	7								
Toledo, Ohio	136	101	18	8	5	2	9								
Youngstown, Ohio	80	55	17	3	4	1	7								
W.N. CENTRAL	977	726	144	47	27	33	51	PACIFIC	2,342	1,589	405	204	66	57	194
Des Moines, Iowa	86	68	16	1	3	-	1	Berkeley, Calif.	21	14	5	1	-	1	-
Duluth, Minn.	42	32	6	2	2	-	2	Fresno, Calif.	101	76	16	1	3	5	9
Kansas City, Kans.	41	26	6	2	4	3	4	Glendale, Calif.	30	26	2	2	-	-	1
Kansas City, Mo.	105	76	21	-	3	5	4	Honolulu, Hawaii	91	65	17	4	3	2	10
Lincoln, Nebr.	40	38	1	1	-	-	5	Long Beach, Calif.	125	89	24	11	-	1	23
Minneapolis, Minn.	288	211	46	15	5	11	20	Los Angeles Calif.	514	344	89	52	19	3	24
Omaha, Nebr.	90	64	9	11	2	4	5	Oakland, Calif.	92	57	21	7	4	3	9
St. Louis, Mo.	162	122	21	10	4	5	7	Pasadena, Calif.	49	38	6	3	2	-	5
St. Paul, Minn.	85	64	9	3	4	5	1	Portland, Oreg.	141	101	16	11	8	4	11
Wichita, Kans. <sup>§</sup>	38	27	9	2	-	-	5	Sacramento, Calif.	204	130	43	12	7	9	22
								San Diego, Calif.	232	161	40	17	5	9	31
								San Francisco, Calif.	231	130	49	42	3	6	7
								San Jose, Calif.	198	144	25	19	6	4	28
								Seattle, Wash.	205	148	32	14	5	6	4
								Spokane, Wash.	59	40	11	4	4	4	7
								Tacoma, Wash.	49	36	9	4	1	-	3
								TOTAL	14,723 <sup>††</sup>	9,700	2,840	1,275	417	476	936

\*Mortality data in this table are voluntarily reported from 121 cities in the United States, most of which have populations of 100,000 or more. A death is reported by the place of its occurrence and by the week that the death certificate was filed. Fetal deaths are not included.

\*\*Pneumonia and influenza.

††Because of changes in reporting methods in these 3 Pennsylvania cities, these numbers are partial counts for the current week. Complete counts will be available in 4 to 6 weeks.

††Total includes unknown ages.

§Data not available. Figures are estimates based on average of past available 4 weeks.

**Measles — Continued**

this outbreak) seeks routine medical care primarily through hospital ERs, as demonstrated by the number of patients with measles seen in ERs. In addition to increasing vaccination coverage in this hard-to-reach group, vaccinating in ERs may help curtail transmission in these settings. However, in Los Angeles County, programmatic constraints have precluded vaccination of susceptible, vaccine-eligible children in most ERs. Transmission in ERs may also be reduced by prompt screening of patients and isolation of those suspected of having measles, a difficult task since measles patients are infectious during the prodrome of their illnesses before the appearance of rash. This control measure was implemented in hospital ERs in Los Angeles County.

Measles transmission in Los Angeles County also occurred among school-aged persons, another major pattern of transmission in the United States (2,8). During a 5-week period in the fall, 47 students and employees at a university in Los Angeles developed measles. As a result of efforts by the state and county health departments, more than 3700 of the estimated 20,000 students at the university were vaccinated at special on-campus clinics. In addition, officials from the health departments urged the university and all other Los Angeles County colleges and universities to require documentation of both measles and rubella immunity as a prerequisite to matriculation, a recommendation supported by the ACIP (7) and the American College Health Association (9).

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**International Notes****Yellow Fever Virus Activity — Trinidad and Tobago**

In December 1988, the Ministry of Health, Trinidad and Tobago, and the Caribbean Epidemiology Center (CAREC) received reports of howler monkeys (*Alouatta* sp.) dying in the Trinity Hills area of the southeastern forests of Trinidad. Surveillance of monkeys in forested areas is a component of the Ministry's ongoing surveillance of sylvatic yellow fever. Field and laboratory investigations did not establish specific evidence of yellow fever in either of two dead monkeys, one decomposing and one freshly shot. However, mosquito surveillance using human landing collections (mosquitoes collected as they landed on humans) yielded two isolates of yellow fever virus from 29 pools of *Haemagogus janthinomys* collected in the forests between

**Yellow Fever — Continued**

December 8 and January 19. Three additional yellow fever isolates were detected in the same pools.

Surveillance for sick or dying monkeys and of forest mosquitoes was intensified after dying monkeys were reported. Initially, health-care facilities near forested areas were alerted to intensify fever surveillance and to encourage unimmunized persons to be vaccinated; subsequently, however, immunization coverage has been expanded island-wide. In Trinidad and Tobago, although intensified fever surveillance for human cases was implemented when reports of dying monkeys were confirmed, no human cases have been detected. As of February 1, 1989, no yellow fever virus has been isolated from monkeys. A program of local spraying of adulticides, identification and elimination of peridomestic breeding sites for *Aedes aegypti*, and application of larvicides has been initiated in villages near the forest edge. Although virus activity remains confined to one forested area, the Ministry of Health has made a public statement advising visitors to forested areas to be immunized.

No evidence of virus activity in the island of Tobago exists, and the port areas and airports of both islands are free of *Ae. aegypti*. Yellow fever virus has never been isolated from *Ae. aegypti* or mosquitoes in Tobago, and the monkeys and mosquitoes associated with sylvatic yellow fever are not found there.

Through CAREC, national epidemiologists and Pan American Health Organization offices of Caribbean countries, along with the World Health Organization (WHO), have been informed of the situation.

*Reported by: M Lewis, RD Deen, Acting Chief Medical Officer, Ministry of Health, Trinidad and Tobago. J Hospedales, B Hull, S Rawlins, Caribbean Epidemiology Center, Port of Spain, Trinidad and Tobago. Div of Vector-Borne Viral Diseases, Center for Infectious Diseases, CDC.*

**Editorial Note:** Yellow fever is enzootic in certain sylvatic locations in South America; however, mechanisms underlying the periodic occurrence of epizootic activity in Trinidad are not fully understood—in particular, it is unknown whether the virus is periodically reintroduced from enzootic areas of South America or is maintained in the forest between outbreaks (1,2). Laboratory studies have shown that transovarial transmission of the virus in mosquitoes is possible (2), but in the western hemisphere, the virus has not been demonstrated in mosquitoes collected from sylvatic locations. Collections of ova, larvae, and adult mosquitoes in the affected forest have been planned to investigate the possibility of vertical transmission (2).

Human cases in Trinidad were last confirmed in 1979 when 18 cases were acquired in sylvatic locations. None of these 18 patients were immunized, and no evidence was found of urban spread by *Ae. aegypti*. That outbreak initially was detected in the Trinity Hills area. Following the outbreak in 1979, 80% of the population >1 year of age was immunized in 1979 and 1980. In addition, an ongoing routine immunization program directed at 1-year-old children was implemented in 1979.

Most persons immunized in 1979 remain protected, and the routine immunization of children born after 1979 has resulted in a 70% level of immunity in children <10 years of age. Efforts have been directed toward full immunization coverage of persons who live or work in or near forests where virus activity is occurring. The high level of immunity that exists in the urban population of Trinidad and Tobago reduces the possibility that a sylvan outbreak could develop into an urban epidemic.

CDC recommends yellow fever vaccination for travelers >9 months of age who leave urban areas (3). Since a yellow fever epizootic has not been established, a change in this recommendation for yellow fever vaccine in travelers to Trinidad is not

**Yellow Fever — Continued**

indicated. A yellow fever vaccine certificate is not required for entry into Trinidad and Tobago except for travelers >1 year of age coming from areas designated by WHO as currently infected with yellow fever.

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**Current Trends****Update: Influenza — United States, 1988-89 Season**

Most influenza viruses reported during the 1988-89 influenza season have been type B. However, the number of states reporting influenza A viruses increased substantially from December 31, 1988, to January 31, 1989. Most of the reported influenza A viruses have been subtype H1N1. As of January 27, influenza type B viruses were reported from 38 states\*, influenza A(H1N1) from 22 states†, and influenza A(H3N2) from seven states‡ this season. Each of these influenza viruses have also been reported from the District of Columbia. Outbreaks of influenza-like illness have occurred in schools, universities, nursing homes, and other group-living facilities. Culture-confirmed outbreaks have been associated with influenza B viruses and both subtypes of influenza A viruses.

*Reported by: Participating state and territorial epidemiologists and laboratory directors. Influenza Branch and Epidemiology Office, Div of Viral Diseases, Center for Infectious Diseases, CDC.*  
**Editorial Note:** Virus cultures should be obtained during outbreaks of influenza-like illness to assess the appropriateness of amantadine therapy. Use of amantadine, an antiviral drug effective against only influenza A viruses, may be considered for prophylaxis or treatment of influenza until results of culturing are known (1).

An increased risk for Reye syndrome in children and teenagers when aspirin is used to treat influenza symptoms has been reported in years when type B influenza has predominated (2,3). Parents, teenagers and children who self-medicate, and health-care workers should be aware of this possible serious complication associated with aspirin use.

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\*Alabama, Alaska, Arizona, Arkansas, California, Colorado, Connecticut, Florida, Georgia, Hawaii, Idaho, Illinois, Iowa, Kansas, Kentucky, Louisiana, Maryland, Michigan, Minnesota, Mississippi, Missouri, Montana, Nebraska, New Mexico, New York, Ohio, Oklahoma, Oregon, Pennsylvania, South Carolina, South Dakota, Tennessee, Texas, Utah, Virginia, Washington, West Virginia, Wisconsin.

†Alaska, Arizona, California, Colorado, Connecticut, Delaware, Hawaii, Illinois, Iowa, Kansas, Maryland, Massachusetts, Minnesota, New York, North Dakota, Ohio, Oklahoma, Oregon, Pennsylvania, Texas, Washington, Wisconsin.

‡Alaska, Colorado, Connecticut, Florida, Hawaii, New York, Pennsylvania.

**FIGURE I. Reported measles cases — United States, Week 52, 1988, & Weeks 1–3, 1989**

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The data in this report are provisional, based on weekly reports to CDC by state health departments. The reporting week concludes at close of business on Friday; compiled data on a national basis are officially released to the public on the succeeding Friday. The editor welcomes accounts of interesting cases, outbreaks, environmental hazards, or other public health problems of current interest to health officials. Such reports and any other matters pertaining to editorial or other textual considerations should be addressed to: Editor, *Morbidity and Mortality Weekly Report*, Centers for Disease Control, Atlanta, Georgia 30333.

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